

REMARKS

After entry of this amendment, claims 1-24 will be pending in this patent application. By this amendment, Applicant has amended claims 1, 2, 4, 5, 7, and 11 to improve clarity and readability, and has added new claims 13-24 to protect additional aspects of the invention. No new matter has been added. Additionally, Applicant does not consider the amendments to be narrowing. In addition to the claim amendments, a paragraph in the specification was amended to correct an obvious typographical error. Reconsideration and allowance of this patent application are respectfully requested in view of the above amendments and the following remarks.

Drawing Objections

Figures 1, 2, 4(a)-(d), 8(b), and 10(a)-(e) were objected to. The Examiner asserts that those Figures “should be designated by a legend such as – prior art – because only that which is old is illustrated.” Applicant notes that the objection is moot with respect to Figures 1 and 2 because those Figures already include a “prior art” legend. Furthermore, Applicant respectfully disagrees with the Examiner’s position and traverses the objection with respect to Figures 4(a)-(d), 8(b), and 10(a)-(e) for at least the following reasons.

Applicant respectfully submits that the Examiner’s interpretation of what Applicant has described as prior art is overly and improperly broad. As Applicant will explain below with respect to the claim rejections, the Examiner’s overly broad interpretation of Applicant’s alleged admissions of prior art have led the Examiner to use Applicant’s own specification against him improperly. The drawing objections are but one manifestation of this problem.

With respect to Figures 4(a)-(d), those Figures are described on page 12 of Applicant’s specification as “graphs illustrating the misalignment of the conventional printed circuit board at

various temperatures.” Applicant submits that while those Figures may illustrate a property of a “conventional printed circuit board,” that does not, without more, make those Figures prior art. Instead, as Applicant will explain below, Applicant submits that Figures 4(a)-(d) illustrate a portion of the inventive process.

In the background section of the application, Applicant briefly described a thermal expansion problem with conventional thermocompression bonding of a printed circuit board to an adherent member. Specifically, Applicant described that during the thermocompression bonding, the lands on the printed circuit board and the leads on the tape carrier package became misaligned due to thermal expansion. Applicant noted that “they are misaligned most in the right portion (A_1) of a first TCP and the left portion of an eighth TCP (A_2).” In order to reduce this problem by conventional techniques “the thickness of the printed circuit board is increased, or the composition of the printed circuit board is changed. However, those methods do not totally solve the misalignment problem when the pitches between the leads become closer.”

The above paragraph, in summary form, reflects the entire content of the background description in the application. Although Applicant described a general thermal expansion problem, Applicant has not stated, implied, or alleged that the precise extent of the thermal expansion problem at multiple points on the printed circuit board was a part of the prior art, and does not do so now. In fact, Applicant submits that that data would not have been necessary in order to implement a conventional solution to the problem, which merely involved changes to the thickness or composition of the circuit board. Regardless of the fact that the data shown in Figures 4(a)-4(d) was gathered using a conventional circuit board, that data was gathered by Applicant during Applicant’s inventive process, for use in performing Applicant’s claimed methods. Therefore, Applicant submits that it is not prior art, and should not be delineated as

such. Accordingly, Applicant respectfully requests that the objection with respect to Figures 4(a)-4(d) be withdrawn.

Figure 8(b) is “a graph comparing the experimental data of the misalignment due to the thermal expansion of the shrinkage printed circuit board with the experimental data of the misalignment of the thermal expansion of the conventional printed circuit board” (emphasis added). Thus, in addition to the reasons given above with respect to Figures 4(a)-4(d), Applicant respectfully submits that Figure 8(b) does not depict “only that which is old.” Accordingly, Applicant respectfully submits that the objection should be withdrawn.

Figures 10(a)-10(e) “are graphs illustrating the misalignment of each sample on the basis of the central line of the conventional printed circuit board according to the table 9.” Applicant submits that those Figures depict data gathered as a part of the inventive process in the same way that Figures 4(a)-4(d) depict data gathered during the inventive process. Accordingly, for the same reasons given above with respect to Figures 4(a)-4(d), Applicant respectfully submits that Figures 10(a)-10(d) do not depict prior art and should not be delineated as such. Accordingly, Applicant respectfully submits that the objection should be withdrawn.

35 U.S.C. § 102 Claim Rejections

Claims 1-7 and 9-12 were rejected under 35 U.S.C. § 102(a) as allegedly being anticipated by what the Examiner characterizes as “prior art . . . admitted by Applicant.” The Examiner specifically identifies Figures 1-2 and 10(a)-10(e). Applicant respectfully disagrees with the Examiner’s position and respectfully traverses the rejection for at least the following reasons.

First, Applicant notes the remarks made above with respect to the drawing objections, and respectfully submits that the Examiner is improperly using Applicant’s own specification

against him. More specifically, for at least the reasons given above with respect to the drawing objections, Figures 10(a)-(e) and the supporting description in the specification are not prior art. Therefore, to the extent that the rejection is based on Figures 10(a)-10(e), the rejection is improper and should be withdrawn.

In view of the above, and setting aside Figures 10(a)-10(d), which the Examiner has improperly identified as prior art, “a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Brothers. v. Union Oil Company of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). Claim 1 recites that “an alignment characteristic of the first conduct pattern group is determined, at least in part, according to thermal expansion degree of the substrate where the first conductive pattern group is positioned.” Independent claim 11 recites that “a thermally expanded conductive pattern group of an output of the printed circuit board is substantially identical in alignment to a conductive pattern group of [an] inherent member.” Applicant respectfully submits that at least those features are not disclosed by Applicant’s alleged admitted prior art.

At most, the background section of the application in which Figures 1-2 are described, contains the disclosures described above with respect to the drawing objections. Neither the background section of the application nor Figures 1-2 disclose an alignment characteristic of the first conductive pattern group that is determined, at least in part, according to a thermal expansion degree of the substrate or a thermally expanded conductive pattern group substantially identical in alignment to a conductive pattern group of an input of an adherent member. Therefore, Applicant respectfully submits that independent claims 1 and 11, and the claims that

depend from them, are not anticipated by Applicant's alleged prior art. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

35 U.S.C. § 103 Claim Rejections

Claim 8 was rejected under 35 U.S.C. § 103(a) over Applicant's alleged admitted prior art in view of Tanaka et al., U.S. Patent No. 6,336,990. Applicant respectfully traverses this rejection.

In order for a prior art reference or combination of references to render a claim obvious, three basic criteria must be met. First, there must be some suggestion or motivation to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the reference or references, when combined, must disclose or suggest all of the claim limitations. The motivation to modify the prior art and the reasonable expectation of success must both be found in the prior art and not based upon a patent applicant's disclosure. *See In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicant respectfully submits that this rejection is improper for at least the same reasons as the rejection made under 35 U.S.C. § 102(a). In particular, Applicant submits that the Examiner is improperly using Applicant's specification against him by designating portions of Applicant's disclosure as prior art when they are not. Additionally, with respect to the requirements for making a rejection under 35 U.S.C. § 103(a), Applicant submits that the Examiner has improperly derived a motivation to combine from Applicant's own disclosure. Accordingly, Applicant submits that the rejection should be withdrawn.

In the alternative, and *arguendo*, regardless of the particular disclosures of Tanaka et al., Applicant respectfully submits that it does not remedy any of the defects of the alleged admitted prior art. Therefore, Applicant submits that claim 8 is not rendered obvious by the cited

combination for at least the same reasons as claim 1 is not obvious over the alleged admitted prior art. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

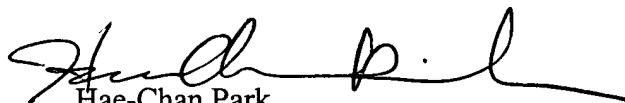
New Claims 13-24

New claims 13-16 are believed to be allowable for at least the same reasons as claims 1 and 11 are allowable. New independent claim 19 recites that “an interval between the printed circuit board land groups [is] smaller than an interval between the connection ports.” Neither Applicant’s alleged admitted prior art nor any other cited prior art reference discloses or suggests at least that feature; therefore, Applicant submits that claim 19 and the claims that depend from it are allowable. New independent claim 23, a method claim, recites “forming printed circuit board land groups that correspond one-to-one with each of the connection ports of the external device on a substrate such that an interval between the printed circuit board land groups is smaller than an interval between the connection ports.” Neither Applicant’s alleged admitted prior art nor any other cited prior art reference discloses or suggests at least that feature; therefore, Applicant submits that claim 23, and its dependent claim are allowable.

CONCLUSION

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. A timely notice to that effect is respectfully requested. If any questions arise, the Examiner is invited to contact the undersigned to discuss those questions. Any fees that may now or hereafter be due in connection with this application, including fees for extensions of time and net addition of claims, may be charged to our Deposit Account, No. 23-1951, under our order no. 61920193AA.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Hae-Chan Park', is written over the printed name.

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